

02/24/14 Agenda:

- Remediation packet is on my web site. If you are planning on retaking the Chapter 7 test, I need it by 2/25 (tomorrow)
- Put together Properties Book
 - Put in Properties & Proving Parallelograms
- Section 8.3 - Parallelograms in the Coordinate Plane
- Homework
 - Worksheet 5 - Parallelograms in the Coordinate Plane

Properties of a Parallelogram.

Page 1

Quadrilateral



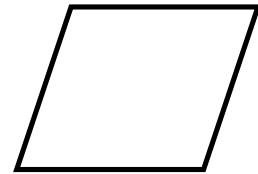
Parallelogram

Parallelogram:

A quadrilateral with BOTH pairs of opposite sides parallel.

Properties:

- Opposite sides are congruent.
- Opposite angles are congruent.
- Consecutive angles are supplementary.
- The diagonals bisect each other.



Quadrilaterals Book

Proving a Quadrilateral is a Parallelogram.

Proving it's a Parallelogram:

Page 2

Show any of the following:

- Both pairs of opposite sides parallel.
- Both pairs of opposite sides are congruent.
- Both pairs of opposite angles are congruent.
- ONE pair of opposite sides are both congruent and parallel
- The diagonals bisect each other.

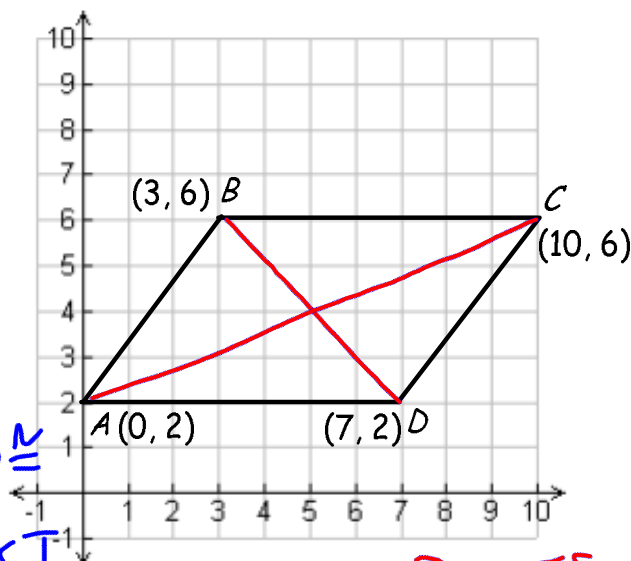
Section 8.3 - Parallelograms in the Coordinate Plane

Target 8D

February 24, 2014

How could we prove this figure is a parallelogram?

1. OPPOSITE SIDES PARALLEL
2. OPPOSITE SIDES CONGRUENT
3. ONE PAIR OF SIDES \parallel AND \cong
4. DIAGONALS BISECT EACH OTHER



2 POINTS

To find the length, use the distance formula:



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\begin{pmatrix} x_1, y_1 \\ x_2, y_2 \end{pmatrix}$$

To see if lines are parallel, compare their slopes:

$$m = \frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{\text{RISE} \updownarrow}{\text{RUN} \leftrightarrow} = \frac{\Delta Y}{\Delta X}$$

If you have the diagonals, see if the intersection is at the midpoint.

Use the midpoint formula:

$$\text{MIDPOINT} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Section 8.3 - Parallelograms in the Coordinate Plane

Target 8D

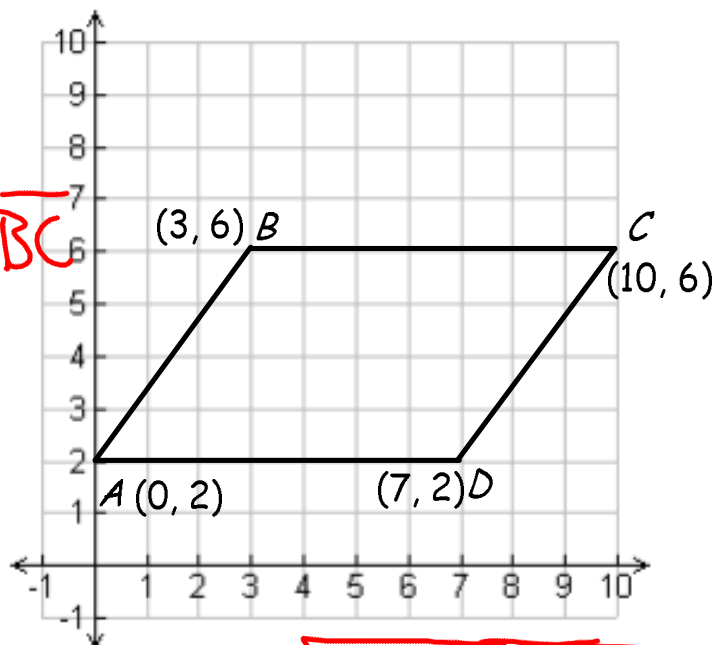
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Find the lengths of AD and BC:

$$AD = 7$$

$$BC = 7$$

$$\overline{AD} \cong \overline{BC}$$



Find the lengths of AB and CD:

$$AB = \sqrt{(3-0)^2 + (6-2)^2}$$

$$\sqrt{3^2 + 4^2}$$

$$\sqrt{9+16} = \sqrt{25}$$

$$CD = \sqrt{(10-7)^2 + (6-2)^2}$$

$$\sqrt{3^2 + 4^2}$$

$$\overline{AB} = 5$$

$$\overline{AB} \cong \overline{CD}$$

What do we know about side lengths? Is this a parallelogram?

YES

Section 8.3 - Parallelograms in the Coordinate Plane

Target 8D

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Find the slopes of AD and BC:

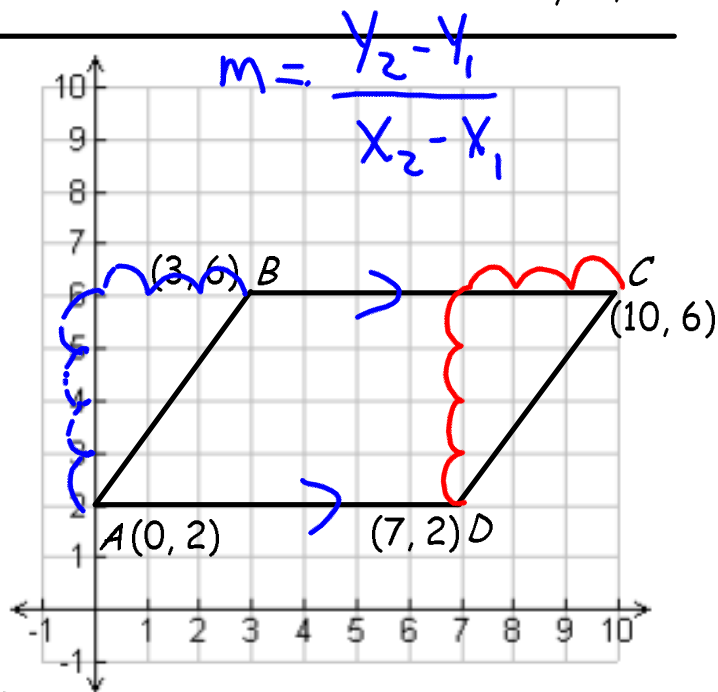
$$m \text{ of } \overline{AD} = 0$$

$$m \text{ of } \overline{BC} = 0$$

Find the slopes of AB and CD:

$$m \text{ of } \overline{AB} = \frac{4}{3}$$

$$m \text{ of } \overline{CD} = \frac{4}{3}$$



What do we know about slope? Is this a parallelogram?

PARALLEL LINES
HAVE SAME SLOPE

YES

Section 8.3 - Parallelograms in the Coordinate Plane

Target 8D

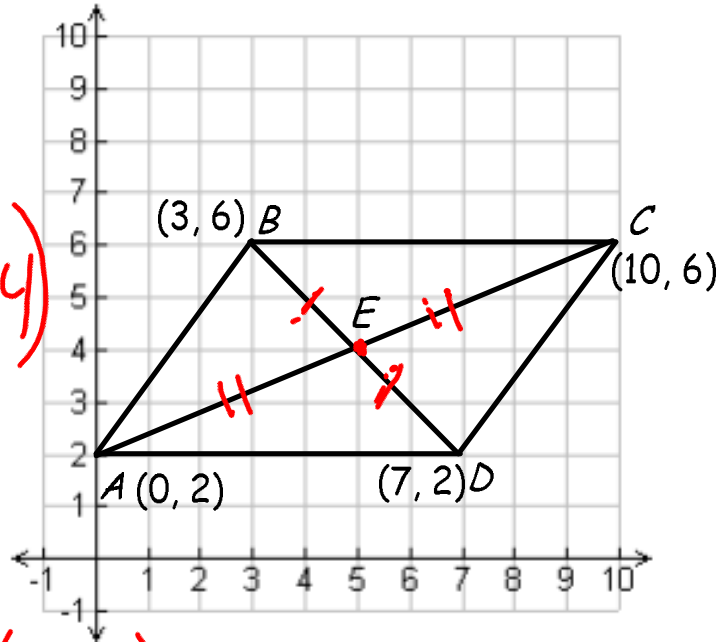
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If E is the point where the diagonals intersect, find the midpoint of AC:

$$\left(\frac{0+10}{2}, \frac{2+6}{2} \right) = (5, 4)$$

Find the midpoint of BD:

$$\left(\frac{3+7}{2}, \frac{2+6}{2} \right) = (5, 4)$$



What do we know about midpoints? Is this a parallelogram?

THEY BISECT
A LINE SEGMENT

YES